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Field of the Invention

This invention relates to locks for displaceable wings and further describes LOCKS within provisional application of 14/7/03 and previously filed provisional applications.

Definitions and Conventions Employed

This specification describes LOCK/S (as defined below) substantially as described herein with reference to and as illustrated in the accompanying drawings.

Throughout this specification and claims which follow, unless the context requires otherwise, the word "comprise", or variations such as "comprises" or "comprising", will be understood to imply the inclusion of a stated integer or group of integers but not the exclusion of any other integer or group of integers.

Throughout this specification and claims which follow, unless the context requires otherwise, the positional prepositions such as rear, forward are used to assist in description of the preferred embodiments and with reference to the accompanying drawings and have in general no absolute significance.

Throughout this specification and claims which follow, unless the context requires otherwise, the words cabinet and wing embraces both displaceable doors and windows and the word door embraces wings.

Throughout this specification and claims which follow, unless the context requires otherwise: ***latching*** *means displacement of the* ***latch-bolt*** *against biasing means by an engageable means (in one form comprising a* ***strike plate)*** *and subsequent displacement of the latch-bolt into engagement with the engageable means (in one form comprising an* ***aperture*** *of the strike plate) under the action of the* ***biasing means;*** ***latch-bolt*** *is an outwardly biased bolt capable of executing latching;* ***auxiliary bolt*** *means an outwardly biased plunger that is operably associated with the latch bolt ;* ***unlatching*** *means withdrawal of the latch-bolt from engagement with the engageable means;* ***unlatching lever*** *is a lever or knob that is hand operable to cause the latch-bolt to become disengaged;* ***locking means*** *configuring the lock to restrain it from becoming unlatched;* ***deadlocking means*** *means means to configure the lock to restrain the latch-bolt from being displaced from the configuration that it assumes when engaged with the engageable means (in the case of a rectilinearly displaceable bolt it assumes a fully extended position when engaged with the engageable means);deadlatching refers to automatic deadlocking of the bolt during latching of the bolt – i.e. the bolt becomes deadlocked as a result of latching;* ***remote-lock*** *means a locking means disposed from the lock that includes a remote bolt that is operably connected to the lock – often there is an upper and a*

lower remote-lock situated above and below the lock; ***French door*** *means a door comprising a hollow frame with a glass in-fill where the hollow within the frame is comparatively small in depth, and* ***security doors*** *means a door comprising a hollow framed with an in-fill where the hollow within the frame is comparatively small in depth and in width - some security doors having a close weaved infill material, some having expanded aluminium mesh;* ***lock-body*** *is the lock portion fitted within the hollow frame of the wing;* ***depth of lock-body*** *is the extent of the lock body in a direction parallel to the face of the door;* ***width of lock-body*** *is the extent of the lock body in a direction at right-angles to the face of the door;* ***free-rotation-cylinder*** *(also called a free-movement-cylinder) is a cylinder comprising a key operable barrel within a* ***cylinder housing*** *connected to a* ***first cam*** *(in one form [and commonly] having a radially protruding arm) with free movement, said free-rotation-cylinder preferably comprising a* ***double cylinder*** *sub-assembly comprised of opposed barrels each connected with free movement to the same first cam such that the cam is free (between limits) to be angularly displaced while the barrels remain undisplaced;* ***free-rotation-cylinder*** *(also called a free-movement-cylinder) is a cylinder comprising a key operable barrel within a* ***cylinder housing*** *connected to a* ***first cam*** *(in one form [and commonly] having a radially protruding arm) with free movement, said free-rotation-cylinder preferably comprising a* ***double cylinder*** *sub-assembly comprised of opposed barrels each connected with free movement to the same first cam such that the cam is free (between limits) to be angularly displaced while the barrels remain undisplaced. This type of (free rotation) cylinder is commonly used in security door locks in Australia – it enable the cam to be displaced by either barrel to a locking configuration and then the barrel to be reverse rotated to an undisplaced position enabling key removal while leaving the cam in the locking position. This type of cylinder is distinct from more commonly used double cylinders that employ clutches and that do not have free rotation between the barrels and first cam;* ***fixed-cam-cylinder*** *is a cylinder comprising a key operable barrel within a* ***cylinder housing*** *connected to a* ***first cam*** *(in one form [and commonly] having a radially protruding arm) without free movement;* ***clutched cylinder*** *is a double fixed-cam- cylinder that includes a clutch to select which barrel is the operative barrel, said operative barrel being displaceable by key to displace the cam (without free movement relative to the operative barrel – said clutched cylinder usually employing key insertion to operate the clutch.*

This and the other provisional applications cited in the complete applications associated with this provisional describe inventions comprising improved ***complete locks*** *for displaceable wings and* ***improvements for locks*** *for displaceable wings,*

*for convenience referred to herein as **"LOCKS"** – the improvements being transportable into other locks and locking devices without being limited to the complete locks described herein.*

Background to the Inventions

Common remote locks such as those employed in security doors operate remote locks by displacing a rod or cable about 11 MM [this displacement being limited by the geometry of a standard Euro cylinder first cam meshing with a commonly used deadlocking slide] In these cases the remote bolt of the remote lock is operably connected to the deadlocking slide by a vertically elongated member (including rod and cable) to be operable by deadlocking slide displacement. Not only does the displacement operate the remote bolts but a portion of the motion is reserved for deadlocking the remote bolt once it has become fully extended – this is to prevent the remote bolt from being displaced inwardly to displace the vertically elongated member to displace the deadlocking slide to unlock a lock that has been locked to the second locking configuration described below. It will be appreciated that 11 MM is not a lot of displacement and it has proved barely sufficient for the purpose. In cases where the remote bolt comprises a simple plunger-like member connected directly to a rod the 11MM is inadequate and the displacement required is at least 15MM.

French doors typically have a strip of compressible sealing material located between the door and the edge that it closes against – this strip being to prevent energy loss. In this case the latch bolt may be restrained by the strike plate from entering the strike plate aperture until a closed door is further displaced in a closing direction (to compress the seal) by other means such as forcing the door and/or employing remote locks. In the latter case, the remote locks (usually comprising a plunger-like member) have to be displaced to bridge the gap between door and door jamb and then further displaced to compress the seal – in practice a minimum of 15 MM has proved necessary. It will also be appreciated that the lock must be capable of delivering actions greater than normally would be required for just locking and unlocking.

To be suitable for French doors a lock must have a lock body: of small depth that typically is not more than 40MM; of small setback that typically is 30MM - (setback being distance from the front of the face plate to a through the centerline of the cylinder and unlatching cam); of small width that typically is 17 MM, and typically, the lock bolt can extend 16 MM from the lock body.

Preferably, an industry standard for the distance between the cylinder and lever axii of 85.00 MM should be observed.

The above requirements impose boundary conditions on the inventions that are quite restrictive. Because the rectilinear bolt needs to extend adequately into the casing (when it is fully extended) to be properly supported and preferably by a portion of length not too dissimilar from the extended length this restriction places requirements on the integers responsible for bolt displacement and restrictions on integers competing for space adjacent the bolt. Because the lock body must fit within an extrusion (and this defines both the width and depth of the lock body) this places restrictions on the width of the bolt and integers competing for space adjacent the bolt and within the casing.

This and prior related provisional applications (related being defined as meaning other provisional applications cited in the complete applications associated with this provisional) describe various LOCKS.

Description of the Figures

Embodiments of the present invention will now be described by way of example only with reference to the accompanying drawings in which:

Fig 1 is a schematic side view of a lock body with the operating lever superimposed.

Fig 2 is a schematic side view of the lock body showing the aux bolt spring, the driver annulus spring, the face plate and method of attachment and the pseudo deadlocking slide spring.

Description of the Preferred Embodiments

Integers include a **bolt 1** and a **casing 2,** said casing in some forms comprising a substantially hollow **box-like member 3** and a **face plate 4** attached to the casing by **screws** (not shown) having passage through **apertures** (not shown) in the face plate to engage in **apertures 9** in the casing, while in other cases a **spacer** member is inserted between the face plate and casing to provide a lock of increased backset in which case the bolt and auxiliary bolt are of extended length. In some forms the face plate and casing comprise a single member such as a single casting.

The bolt preferably comprising a **first portion 11** (being a substantially prism-like solid) that is displaceable from the casing (by having passage through a **bolt aperture** in the face plate (not shown)) and a **return portion 13** within the casing by which the bolt is supported,

Preferably, the corners of the upper and lower edges of the aperture are preferably radiused in form to provide increased face plate strength and the upper and lower edges of the bolt are configured to conform to the aperture profile.

The bolt in some forms comprises an outwardly biased latch bolt as shown in Fig 1, that in some forms has a **leading end 14** profiled on both sides to accommodate both left hand and right hand doors wherein the leading end has curved, chamfer or otherwise profiled sides to facilitate or assist latching wherein the latch bolt is engageable on either side by a strike plate to be inwardly displaced by the strike plate during latching whereby to be and suitable both left hand and right hand hinged doors.

In some forms the bolt is deadlockable such that it cannot be displaced from the extended position by external forces.

Integers include an outwardly biased **auxiliary bolt 16** comprising a **first portion 21** (being a substantially prism-like solid) that is displaceable from the casing by having passage through a **bolt aperture** (not shown) in the face plate and a **return portion 23** within the casing by which it is supported, the first portion in some forms has a **leading end 53** profiled on both sides to accommodate both left hand and right hand doors that has curved, chamfer or otherwise profiled sides to facilitate or assist latching wherein the latch bolt is engageable on either side by a strike plate to be inwardly displaced by the strike plate during latching whereby to be and suitable both left hand and right hand hinged doors.

The return portion 23 has an **engaging shoulder** (not shown) (that is preferably ramped in form) protruding towards an adjacent **pseudo-deadlocking slide 205** to overlap an engageable **ramped shoulder** (not shown) of the pseudo-deadlocking slide 205 that extends towards the return portion of the auxiliary bolt. The engageable shoulder is displaced from the bolt by inwards displacement of the auxiliary bolt, said displacement causing the engaging shoulder to slide along the ramp to urge the pseudo-deadlocking slide away from the bolt to thereby release the bolt to enable it to be displaced to the fully extended position by the spring 37. This arrangement is used to restrain the latch-bolt with the leading end described above, in a partly extended position prior to latching to facilitate latching of a bolt that otherwise would protrude too far to be latched i.e. if fully extended it would protrude beyond the curved lip of a conventional strike plate. The auxiliary bolt is outwardly biased by **a spring** (not shown). The pseudo deadlocking slide has a **leading end shoulder 201** that is engageable in **recess 202** of the bolt and it is urged towards this engagement by **spring 203** housed in a recess in the said slide. As the bolt is

retracted by lever operation, the shoulder 201 displaces into the recess 202 as soon as it presents itself to restrain the bolt in the pre-latching configuration.

Integers further include an **unlatching rocker 20** comprising an angularly displaceable member supported at a **pivotal axis 25** defined by a **pinned extension 26** of the casing side wall 27, with a **first arm 28** extending (from the pivotal axis) **upwardly** to terminate in a **engageable shoulder 28A** while the **second arm 34** extends downwardly to overlap the return bolt portion 13 to be operably connected to the bolt such that the bolt is inwardly displaceable by anti-clockwise angular displacement of the unlatching rocker. Preferably, the overlapping arm portion includes a sideways protruding **drive pin 35** that locates within a substantially vertical **drive slot 36** that in some embodiments is angled rearwardly as it progresses downwardly.

Integers include means to outwardly bias the latch bolt comprising the **spring 37** to urge the bolt.

Integers further includes at least one **unlatching cam 39** connected by shaft (not shown) (the shaft passing from an exterior to an interior **operating lever 41** while having passage through a mating aperture in the cam) (said levers in forms comprising part of **handle assemblies** (not shown) mounted to both face of the door) said unlatching cam having a downwardly extending **unlatching arm 43** that has towards the free end a **driving shoulder** 44 that is displaceable in a forward direction by downwards lever operation to rotate the rocker 20 in an anti-clockwise direction to cause the bolt to retract. . The unlatching cam is preferably supported by sideways protruding **cylindrical portions 45** that extends into a **circular aperture** in each side of the casing and the cylindrical portion has the **shaft recess 46** to receive and mate with the **shaft** (not shown). In alternative forms there is an exterior lever connected to an outer unlatching cam by an exterior shaft and an interior lever connected to an inner unlatching cam by an interior shaft each said unlatching cam having only one cylindrical portion supported within a side aperture of the casing.

Integers include an interior hand operable member locking member that in one form comprises a **locking lever 67** (also called a snib-lever) that is connected by a **spindle** (not shown) to an angularly displaceable **locking cam 69** having a spindle **aperture 69A** with which it mates.

Integers further include a **deadlocking slide 73** that in some cases is co - operable with a fully extended bolt to restrain the bolt from being displaced from the fully extended position – in which case a **leading end 74** of the deadlocking slide is engageable behind an **engageable shoulder 75** of the bolt – the configuration in which the bolt and slide cooperate is referred to as the deadlocking configuration and

when so engaged the deadlocking slide can be said to be in a deadlocking position (this position actually comprising a limited range of slide positions over which the bolt and slide so cooperate). The deadlocking slide leading end is preferably **ramped 74A** so that displacement of the slide towards a not-fully-extended-bolt will cause the ramp to slide over shulder 75 to cause the bolt to be outwardly displaced.

Integers further includes an angularly displaceable **first cam 77** having a radially protruding **cam arm 78** that [as described in Watts AU 706589 and subsequent divisionals patents which are included herein by reference] comprises part of a **free-rotation-cylinder 79.**

In forms, the deadlocking slide is operably connected to the locking lever by the shaft 68 that is connected to the angularly displaceable **locking cam** supported in the casing and connected to the deadlocking slide. The cam 69 is preferably supported by cylindrical portions that are supported within a circular aperture in the side walls of the casing, said locking cam having a sideways protruding **arm 81** that engages in a **horizontal slot 82** in the deadlocking slide.

In forms including the cylinder, the deadlocking slide is operably connected to the first cam the deadlocking slide has a **drive recess 83** having an **upper drive face 84** on which the first cam arm engages to drive the deadlocking cam towards the deadlocking configuration and having a **lower drive face 85** on which the cam arm engages to drive the deadlocking slide from the deadlocking configuration and an **exit shoulder 86** (preferably comprising an angled face) connected to the upper drive face disposed such that when in the deadlocking configuration the first cam cam be disposed such that an end face of the cam 87 (a face of constant radius) is adjacent the exit shoulder such that the force that is applied to the first cam by the deadlocking slide when an attempt is made to move the deadlocking slide from the deadlocking configuration (as might occur in an attempt to rotate the snib lever) has a direction that passes through the pivotal axis of the cam and so the cam cannot be so rotated and the first cam in this configuration restrains the deadlocking slide.

In forms of LOCKS there are two locking modes: **a second mode** characterized by the first cam arm being within the drive recess and the deadlocking slide having been displaced into the deadlocking configuration by the locking lever or by the first arm (the first arm being operably connected to a cylinder); a **first mode** characterized by the deadlocking slide fully displaced into the deadlocking configuration and the first cam arm displaced from within the drive recess (the first arm being operably connected to a cylinder) to restrain the deadlocking slide fully displaced in the deadlocking configuration from which the deadlocking slide cannot be displaced by the locking lever.

In preferred forms of the invention, the deadlocking slide supports a spring loaded **ball** that is engageable in **recesses** in the side of the casing corresponding to an undisplaced slide **and** a deadlocked slide in the second deadlocking configuration. When the slide is displaced to the first deadlocking confiuration it is doeen so againstbubiasing casused by the ball and spring.

There is preferably an oversized **aperture** allowing passage of the ball to enable the ball and spring to be loaded after the lock has been assembled.

Alternatively, the deadlocking means includes a deadlocking slide (substantially as described above) and a cylinder substantially as described above but having a clutch (where there is no free movement between barrel and cam) where the cam is operated by being rotated 360 degrees – in which case, the locking lever and cam 69 are omitted. In this case during locking, the first cam leaves the recess, passes over the exit face and comes to rest in the initial undisplaced position enabling key removal. In this case, the spring loaded **ball** is engageable in **recesses** corresponding to an undisplaced slide **and** a deadlocked slide in the first deadlocking configuration. There is preferably an oversized **aperture** allowing passage of the ball to enable the ball and spring to be loaded after the lock has been assembled.

The lock further includes drive means to operate a) a remote lock that is operated by a vertically elongated drive member that connects to one or other of the drive slides of the lock and b) an upper and lower remote lock each operated by a single vertically elongated drive member that runs from one to the other and is connected to a drive slide of the lock and an upper and lower remote lock each operated by a separate drive slide each connected by a separate vertically elongated drive member.

The drive member in one form comprises a rod with ends adapted to be connected to a drive slide said adaption in one form comprising a right angle return portion. The drive member in another form comprises an inner Bowden cable with an end adapted to be connected to a drive slide said adaption in one form comprising a right angle return portion.

The lock includes one and preferably a pair of counteracting drive slides and an angularly displaceable **driver member 212** preferably comprising **a drive annulus** that is supported within the casing within a raised **annular wall 213** that completely or partly surrounds the annulus, said annular wall being supported by a casing side wall.

In a form of the invention, the driver member at radial distance from its pivotal axis is operably connected to **an upper drive slide 221** by a **first pin-joint** (providing relative angular displacement between the driver and slide) comprising a **pin** free

within the slide and embedded in the driver member, or alternatively by a first slide-joint comprising a protruding pin of the driver member within a substantially horizontal slot of the drive slide. In some forms, the drive member is connected to a **lower drive slide** by a **second pin-joint** or by a second slide-joint. Preferably the first and second joint are on opposite sides of the drive pivotal axis with one being rearwardly disposed while the other is forward disposed, and preferably the first joint is rearwardly disposed as shown in Fig 1. . Preferably the first and second joint are on opposite sides of the driver member with one being adjacent one side of the casing and the other adjacent the other as shown in Fig 1.

Preferably the radial distance between the pin of the first pin-joint and pivotal axis (defined here as the **effective radius)** is substantially the same the radial distance between the pin of the second pin-joint and pivotal axis and preferably the radial distance between the pins of the slide-joints and pivotal axis is also substantially the same as the effective radius.

Preferably, the **pivotal axii 39A** of the unlatching cam 39 and lever 41 is parallel to and separate from the pivotal axis of the driver member by less than the effective radius of the driver member and in a preferred form of the invention the cylindrical portions of the unlatching cam are supported in apertures in the casing side walls said apertures being within a circumference defined by the effective radius and where the driver member takes the form of an annulus, the unlatching cam is within the outer circumference of the driver member.

The driver member has two drive driven shoulders 206 and 205 (in a form defined by a recess therebetween) that are engageable by a drive arm 207 comprising a radially extension of the drive cam 39 and they are spaced such that when the driver member is undisplaced and the lever 41 is undisplaced, the drive arm abuts 206 and when the lever is lifted to fully displace the driver member (to operate [latch] remote locks) the arm 207 engages 206 and displaces it downwardly to a limit and when the lever is then returned to the undisplaced position arm 207 abuts 205 as shown in Fig 1. When the lock is unlatched by pushing the lever down the arm 207 drives 205 to the undisplaced position (to operate [unlatch] remote locks). Importantly the fully retracted latch bolt coincides with an undisplaced driver member.

In a preferred embodiment where both drive slides are towards the rear of the casing, the second pin of the pin-joint is connects an intermediate member 224 to the driver member. Intermediate member 224 is connected by a third pin-joint to a rocker 227 that extends from a fourth pivotal joint 229 located forward of the casing to terminate in a free end rear of the casing, said free end including a fifth pin-joint 226

shared with an alternative lower drive slide 221B that extends towards the lower end of the casing and preferably passing behind the locus of the bolt. By this and other means the first bolt portion is enabled to slide between the side walls of the casing and the casing (for a given bolt width) has minimum width by not having to accommodate other components beside the bolt first portion.

Rotation of the annulus in a locking direction (anti-clockwise) by lifting the lever drives 221 upwardly (to extend a remote bolt) and the member 221B downwardly by causing the intermediate member to pull the rocker downwardly (to extend a remote bolt). Preferably the upper and lower drive slides displace simultaneously in opposite directions and preferably the total displacement of each is identical (although at any intermediate position this may not be so) and so preferably the lengths of the intermediate member, the length of the rocker and the location of the joints are configured to provide such. Rotation of the driver member in a unlocking and unlatching direction (clockwise) by lowering the lever (to retract the latch bolt) also drives the member 221B upwardly and 221 downwardly (to retract remote bolts).

Integers further include a means of releaseably restraining the driver member in the fully displaced position to restrain the elongated drive members against displacement and to restrain driver member in the undisplaced position to restrain the unlatching cam from being displaced by levers biased towards the undisplaced position but needing to displace upwardly from that position to operate the remote locks, said means including a recesses 240 within the side of the drive annulus, a ball 241 biassed towards the annulus by spring 242.

Integers further includes, a lower secondary slide 230 (preferably comprising rod) a that is connected by a pin-joint to the lower drive slide and this secondary slide has upper and lower sideways protruding pins that slide within slots in the casing sides – said slide having an aperture to receive the return portion of a lower rod or a an aperture to receive a return portion of a lower Bowden cable. It is convenient to note here that the upper drive slide is supported between substantially vertical walls of an extension to the component defines a portion of the annulus side wall, said upper drive slide at its upper end having am aperture to receive the return portion of an upper rod or an aperture to receive a return portion of an upper Bowden cable. Where it is required for the cable or rods to operate in the same direction, the secondary slide is connected to the first drive pin by an elongated member preferably comprising a rod.

When the bolt is restrained by the deadlocking slide, the rocker 20 cannot be displaced so the lever cannot be operated downwardly.

It should be stated in the context of this specification that a remote lock or remote engaging means or remote engaging member all include a simple plunger like member connected directly to a vertically elongated member that connects to a drive slide or a more sophisticated device where a remote bolt is actuated by an intermediated mechanism that in some cases includes a remote lock casing and in some cases includes means for separately deadlocking the remote bolt (said deadlocking being effected by displacement of the associated drive slide)

The above can be configured to provide:

- 15 MM movement for both an upper and a lower drive slide
- drive slides operated by levers to ensure that higher forces can be delivered to the drive slides than can be delivered by common devices that employ key operation to drive the slides
- a bolt having 16 MM fully extended length
- a bolt of 14 MM width
- a casing of 17 MM width
- backset of 30 MM
- a casing depth of 40 MM
- levers that rotate downwardly (to unlatch) less than 45 degrees
- a casing of 150 MM
- a distance between cylinder and lever axii of 85 MM
- a bolt in the middle of the face plate
- interchangeable face plates

Forms of Strike Plates and Cylinders

LOCKS further include a substantially conventional **strike plate** that is modified as shown in Fig 17, said strike plate comprising an aperture 130 engageable with the extended bolt and including a front aperture edge 131 against which the bolt pushes if one attempts to open a locked door. The aperture is within a substantially flat plate-like portion 132 extending from between a lower slot 133 to an upper slot 133 and connected to a blade 134 that preferably comprises an angled or curved blade. The blade is connected by bridges 135 of reduced cross-sectional area 156 and the strike is of a deformable material enabling these bridges to deform without cracking and the reduced area enables deformation to occur at reduced forces – these characteristics enabling the blade to be angularly displaced about an axis 157 that passes substantially through each bridge.

The bridges connect to fixable portions 158 that include apertures 159 through which screws shanks have passage and by which the fixable portion is attached to a doorjamb. In some types of deformation the fixable portions angularly displace about the screw – this displacement being afforded by the reduced strength of the bridge portion that deforms to accommodate such displacement.

The blade of this design supports the front edge and the blade is only attached at each end (by fixable portions) to the doorjamb thereby being deformable like a bow and at moderate forces.

The upper and lower extremes of the plate-like portion 132 (that portion between the aperture 130 and the slot 133), portions 140 are of reduced cross-sectional area to enable these portions to deform under low forces so as to deform as the blade portion angularly displaces – these portions engaging the face of the lock as the bridge portions deform to enable the blade to displace.

When a closed and locked door is urged open under the action of a jemmy placed adjacent the bolt, the bolt is forced against the front edge while the lock is simultaneously displaced away from the strike plate and in this case the bolt drags the front edge (while deforming the blade) with it to remain engaged – and in this case the bridges may deform and move closer together (through rotation) to enable the blade to further deform to enable the front edge to further displace.

If the jemmy rests on the strike plate as it is rotated then this action causes the blade to angularly displace to deform the bridges. Typical deformation is as shown in Fig 21

When a closed and locked door is urged open under the action of a jemmy placed adjacent the bolt, the bolt is forced against the front edge while the lock is simultaneously displaced away from the strike plate in general and in this case the bolt drags the front edge (while deforming the blade) with it to remain engaged with it – and in this case the bridges may further deform and effectively move closer together (through rotation) to enable the blade to further deform to enable the front edge to further displace.

By this action the bolt is able to cause the strike plate front edge to displace with it whereby to maintain engagement between the bolt and strike plate while the screws attaching the strike plate to the door jamb are subjected to lower forces and are less likely to pull out than they would in a conventional strike plate]

The invention provides a first cam comprising part of a free-movement-cylinder that includes at least one compression spring between the cam and a barrel (located within an axial pocket of the cam) to urge the cam against (the opposed barrel or against its associated circlip or against an edge of the housing) to cause

increased friction on the cam so that if the cam is displaced through engagement with another member, such as a deadlocking slide, it will come to rest soon after the deadlocking slide ceases to act – the friction acting contrary to the rotational inertia of the cam, alternatively the cylinder may include a compressed wave washer located between the cam and the adjacent circlip that retains the adjacent barrel; in either case what is important is that the cam is subject to frictional forces that gives rise to a moment that act to accelerate (negatively) a moving cam till it comes to rest and importantly, to come to rest while the cam arm is within the drive recess so that the lock does not become locked in the first locking mode*]*

The Claims defining the Invention Are:

'1 A lock for a displaceable wing including at least one remote bolt, a strike plate,

a lock body including a single bolt by which to restrain the wing from being moved in an opening direction, an operable lever by which to retract the bolt and an angularly displaceable unlatching cam to operably connect the bolt to the lever,

an angularly displaceable driver member by which to operably connect the at least one remote engaging means to the lever;

said driver member being operably associated with the unlatching cam and displaceable by the unlatching cam to operate the remote bolt.

'2 A lock according to Claim 1, wherein the axis of rotation of the unlatching cam and driver member are separated by a distance not exceeding the effective radius of the driver member

'3 A lock according to Claim 1 or Claim 2, including an upper and a lower drive slide operably connected to the driver member, each located towards the rear of the casing and each displaceable simultaneously in the opposite direction.

'4 A lock according to any one of the above claims, wherein the driver member comprises a driver annulus

'5 A lock according to any one of the above claims, wherein the bolt comprises a latch bolt and the lock is characterized by a pre-latching configuration

'6 A lock according to any one of the above claims, wherein

'7 A lock according to any one of the above claims, wherein the lever and unlatching cam are located above the latch bolt, said bolt being operably connected to the unlatching cam by an intermediate rocker member having an operating arm.

'8 A lock according to any one of the above claims, including deadlocking means to restrain the bolt in the fully extended position including a key operable cylinder.

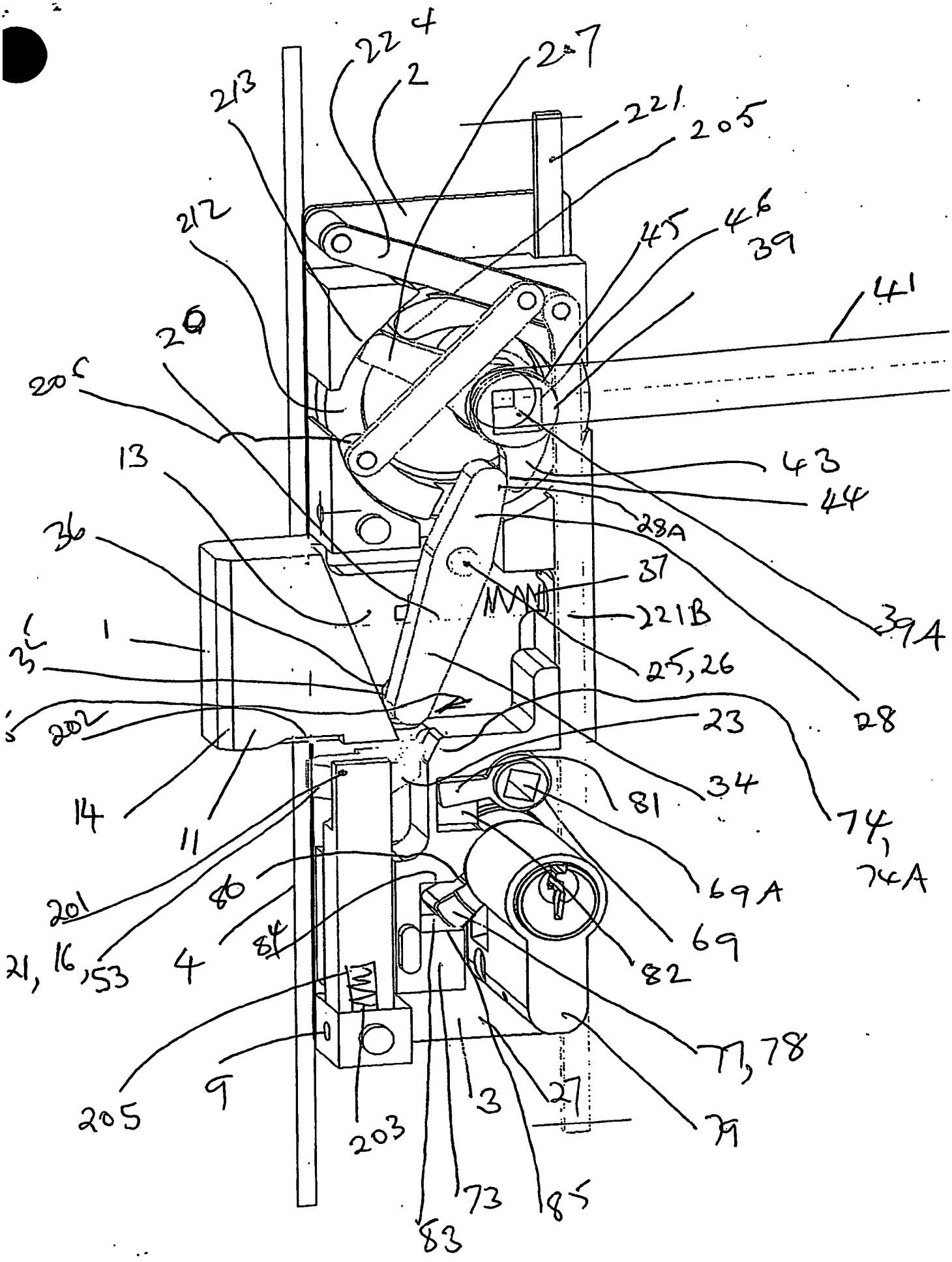
'9 A lock according to Claim 8, wherein the deadlocking means includes a locking lever

'10 A lock according to Claim 8, wherein the deadlocking means includes a deadlocking slide displaceable by both the locking lever and by the cylinder

'11 A lock according to any one claim above, wherein the lock body includes a casing of small depth, small width and small length

'12 A lock according to Claim 8, wherein the cylinder comprises a double cylinder

'13 A lock according to Claim 12, wherein the cylinder comprises a free-rotation-cylinder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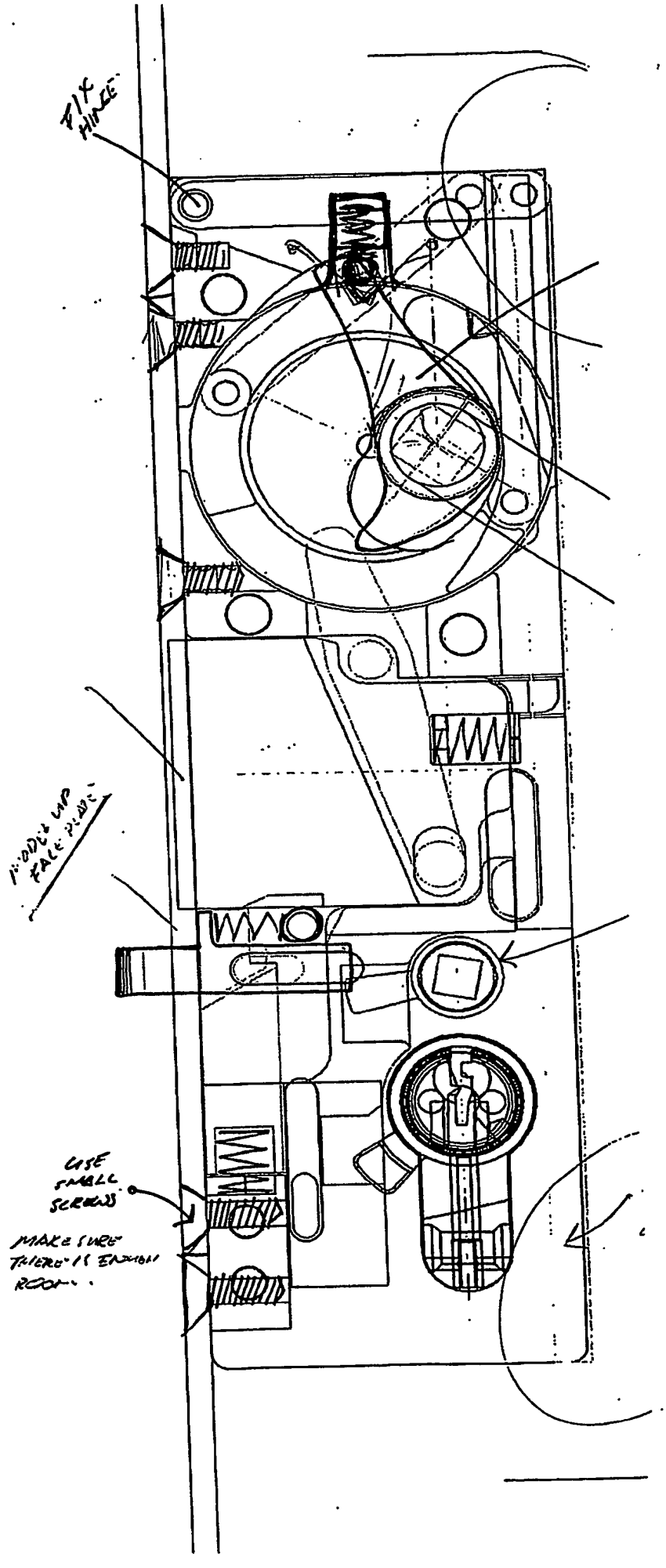
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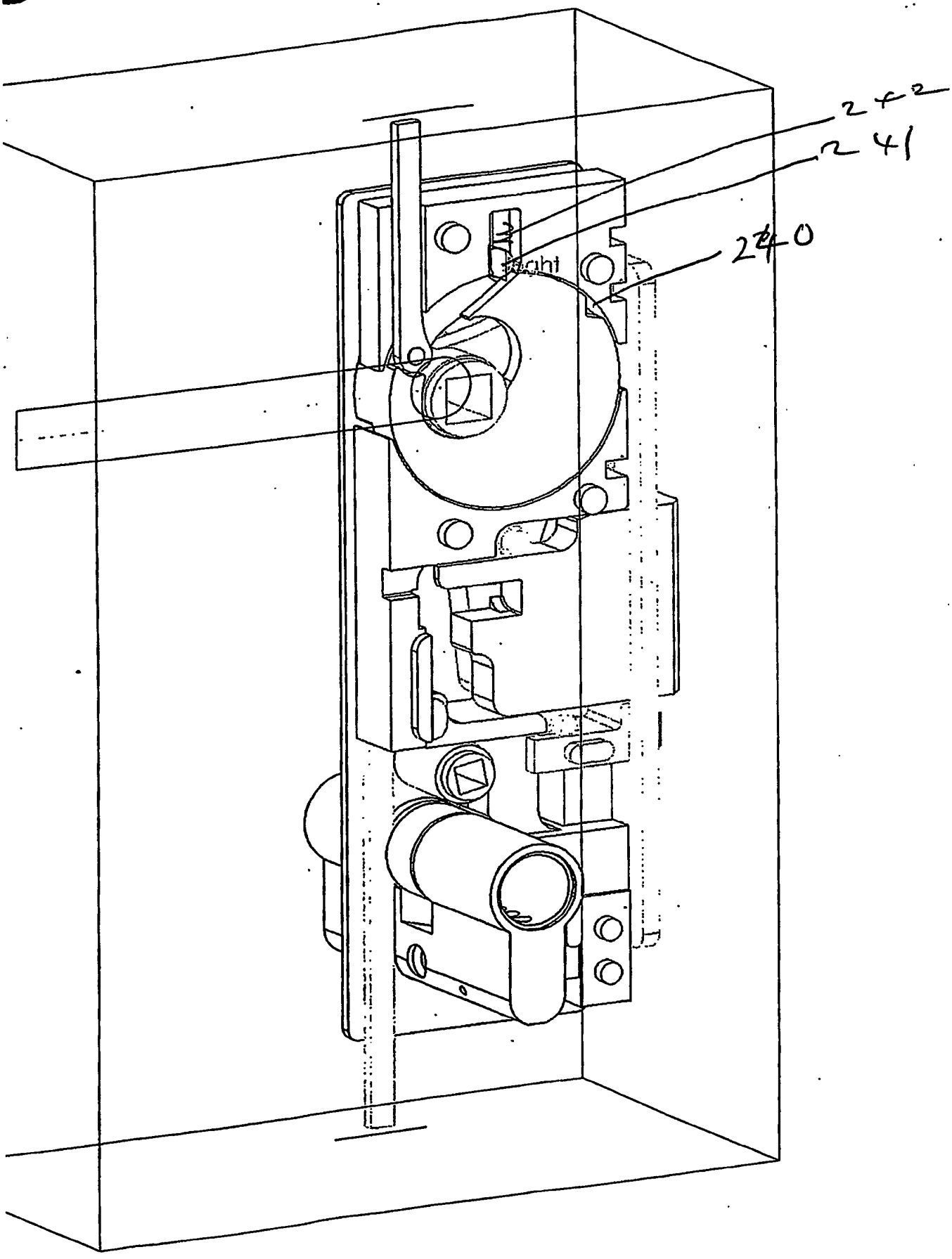
USE SMALL SCREWS
MAKE SURE THERE IS ENOUGH ROOM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